

DERWENT-ACC-NO: 1997-283244

DERWENT-WEEK: 200436

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TITLE: Manufacture of thin film transistor liquid  
crystal  
displays - with reduced number of  
photolithography steps  
preventing battery effect and hillock  
generation

INVENTOR: LEE, J; NAM, H ; LEE, J G ; LEE, J H ; NAM, H R

PRIORITY-DATA: 1996KR-0013912 (April 30, 1996) , 1995KR-0042618  
(November 21,  
1995) , 1995KR-0044893 (November 29, 1995)

PATENT-FAMILY:

| PUB-NO            | PUB-DATE          | LANGUAGE |
|-------------------|-------------------|----------|
| PAGES MAIN-IPC    |                   |          |
| JP 2004157554 A   | June 3, 2004      | N/A      |
| 015 G02F 001/1368 |                   |          |
| * EP 775931 A2    | May 28, 1997      | E        |
| 016               |                   |          |
| JP 09171197 A     | June 30, 1997     | N/A      |
| 009 G02F 001/136  |                   |          |
| KR 97028663 A     | June 24, 1997     | N/A      |
| 000 G02F 001/136  |                   |          |
| KR 97028758 A     | June 24, 1997     | N/A      |
| 000 G02F 001/133  |                   |          |
| US 6008065 A      | December 28, 1999 | N/A      |
| 000 G02F 001/1343 |                   |          |
| KR 183757 B1      | May 1, 1999       | N/A      |
| 000               |                   |          |
| KR 219480 B1      | September 1, 1999 | N/A      |
| 000 H01L 021/00   |                   |          |
| TW 426809 A       | March 21, 2001    | N/A      |
| 000 G02F 001/133  |                   |          |
| US 6331443 B1     | December 18, 2001 | N/A      |
| 000 G02F 001/136  |                   |          |
| US 6339230 B1     | January 15, 2002  | N/A      |
| 000 G02F 001/13   |                   |          |
| US 20020106825 A1 | August 8, 2002    | N/A      |
| 000 H01L 021/00   |                   |          |
| US 6661026 B2     | December 9, 2003  | N/A      |
| 000 H01L 021/84   |                   |          |

H01L 021/84

H01L 021/336

INT-CL (IPC): G02F001/13, G02F001/133, G02F001/1343, G02F001/136, G02F001/1368, H01L021/00, H01L021/28, H01L021/3205, H01L021/336, H01L021/768, H01L021/84, H01L029/423, H01L029/49, H01L029/786

ABSTRACTED-PUB-NO: EP 775931A

## BASIC-ABSTRACT:

Method for manufacturing a liquid crystal display by: (a) forming a gate electrode and gate pad by sequential deposition of first and second metal films on a substrate on a thin film transistor TFT area and a pad area by a first photolithography process; (b) forming an insulating film over the entire surface; (c) forming a second semiconductor film pattern on the TFT area by a second photolithography process; (d) forming source and drain electrodes of a third metal film in the TFT area by a third photolithography process; (e) forming a protection film pattern so as to expose a portion of the drain electrode and gate pad by a fourth photolithographic process; and (f) forming a pixel electrode connected to the drain electrode and gate pad by a fifth photolithographic process.

USE - Thin film transistor liquid crystal displays.

ADVANTAGE - Manufacturing costs are reduced and productivity increased by reducing the number of photolithographic processing steps. Battery effect and hillock generation are prevented. Deterioration of device is avoided by preventing generation of an undercut in a gate electrode.

ABSTRACTED-PUB-NO: US 6008065A

EQUIVALENT-ABSTRACTS:

Method for manufacturing a liquid crystal display by: (a) forming a gate electrode and gate pad by sequential deposition of first and second metal films on a substrate on a thin film transistor TFT area and a pad area by a first photolithography process; (b) forming an insulating film over the entire surface; (c) forming a second semiconductor film pattern on the TFT area by a second photolithography process; (d) forming source and drain electrodes of a third metal film in the TFT area by a third photolithography process; (e) forming a protection film pattern so as to expose a portion of the drain electrode and gate pad by a fourth photolithographic process; and (f) forming a pixel electrode connected to the drain electrode and gate pad by a fifth photolithographic process.

USE - Thin film transistor liquid crystal displays.

ADVANTAGE - Manufacturing costs are reduced and productivity increased by reducing the number of photolithographic processing steps. Battery effect and hillock generation are prevented. Deterioration of device is avoided by preventing generation of an undercut in a gate electrode.

US 6331443B

Method for manufacturing a liquid crystal display by: (a) forming a gate electrode and gate pad by sequential deposition of first and second metal films on a substrate on a thin film transistor TFT area and a pad area by a first photolithography process; (b) forming an insulating film over the entire surface; (c) forming a second semiconductor film pattern on the TFT area by a second photolithography process; (d) forming source and drain electrodes of a

third metal film in the TFT area by a third photolithography process;  
(e)  
forming a protection film pattern so as to expose a portion of the drain  
electrode and gate pad by a fourth photolithographic process; and (f)  
forming a  
pixel electrode connected to the drain electrode and gate pad by a  
fifth  
photolithographic process.

USE - Thin film transistor liquid crystal displays.

ADVANTAGE - Manufacturing costs are reduced and productivity  
increased by  
reducing the number of photolithographic processing steps. Battery  
effect and  
hillock generation are prevented. Deterioration of device is avoided  
by  
preventing generation of an undercut in a gate electrode.

US 6339230B

Method for manufacturing a liquid crystal display by: (a) forming a  
gate  
electrode and gate pad by sequential deposition of first and second  
metal films  
on a substrate on a thin film transistor TFT area and a pad area by a  
first  
photolithography process; (b) forming an insulating film over the  
entire  
surface; (c) forming a second semiconductor film pattern on the TFT  
area by a  
second photolithography process; (d) forming source and drain  
electrodes of a  
third metal film in the TFT area by a third photolithography process;  
(e)  
forming a protection film pattern so as to expose a portion of the drain  
electrode and gate pad by a fourth photolithographic process; and (f)  
forming a  
pixel electrode connected to the drain electrode and gate pad by a  
fifth  
photolithographic process.

USE - Thin film transistor liquid crystal displays.

ADVANTAGE - Manufacturing costs are reduced and productivity  
increased by  
reducing the number of photolithographic processing steps. Battery  
effect and

hillock generation are prevented. Deterioration of device is avoided by preventing generation of an undercut in a gate electrode.

US20020106825A

Method for manufacturing a liquid crystal display by: (a) forming a gate electrode and gate pad by sequential deposition of first and second metal films on a substrate on a thin film transistor TFT area and a pad area by a first photolithography process; (b) forming an insulating film over the entire surface; (c) forming a second semiconductor film pattern on the TFT area by a second photolithography process; (d) forming source and drain electrodes of a third metal film in the TFT area by a third photolithography process; (e) forming a protection film pattern so as to expose a portion of the drain electrode and gate pad by a fourth photolithographic process; and (f) forming a pixel electrode connected to the drain electrode and gate pad by a fifth photolithographic process.

USE - Thin film transistor liquid crystal displays.

ADVANTAGE - Manufacturing costs are reduced and productivity increased by reducing the number of photolithographic processing steps. Battery effect and hillock generation are prevented. Deterioration of device is avoided by preventing generation of an undercut in a gate electrode.

CHOSEN-DRAWING: Dwg.11/23